

FACSIMILE TRANSMITTAL FORM	Application Number	09/997081
	Filing Date	November 28, 2001
	First Named Inventor	Clark, John C.
	Art Unit	1753
	Examiner Name	Kishor Mayekar
Fax: 703-872-9306	Attorney Docket Number	57255US002
Total Number of Pages in This Submission: 13		
Date: May 10, 2005	Attorney for Applicant: Philip Y. Dahl	

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Patent
Case No.: 57255US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: CLARK, JOHN C.

Application No.: 09/997081

Group Art Unit: 1753

Filed: November 28, 2001

Examiner: Kishor Mayekar

Title: ELECTROPHORETICALLY DEPOSITED HYDROPHILIC COATINGS FOR FUEL
CELL DIFFUSER/CURRENT COLLECTORBRIEF ON APPEALMail Stop: Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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I hereby certify that this correspondence is being transmitted by facsimile on the date
shown below to the United States Patent and Trademark Office at (703) 872-9306.May 10, 2005
Date
Signed by: Phyllis Boettcher

Dear Sir:

This is an appeal from the Office Action mailed on November 10, 2004, finally rejecting claims 1-11.

A Notice of Appeal in this application was mailed on March 10, 2005, and was received in the USPTO on March 10, 2005.

The fee required under 37 CFR § 41.20(b)(2) for filing an appeal brief should be charged to Deposit Account No. 13-3723.

Appellants request the opportunity for a personal appearance before the Board of Appeals to argue the issues of this appeal. The fee for the personal appearance will be timely paid upon receipt of the Examiner's Answer.

Application No.: 09/997081Case No.: 57255US002**REAL PARTY IN INTEREST**

The real party in interest is 3M Company (formerly known as Minnesota Mining and Manufacturing Company) of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences.

STATUS OF CLAIMS

Claims 1-14 are pending. Claims 12-14 are withdrawn. Claims 1-11 stand rejected. Claims 1-11 are the subject of this appeal.

STATUS OF AMENDMENTS

No amendments have been filed after the final rejection.

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SUMMARY OF CLAIMED SUBJECT MATTER

The claims at issue concern methods of making a hydrophilic carbon fiber construction. The method can be used to make a hydrophilic carbon fiber construction capable of wicking 200mg of water for each 40mg weight of the construction itself, or even 250mg of water per 40mg weight of the construction. (See, e.g., Specification at page 6, Ins. 10-20 and Examples). The hydrophilic carbon fiber construction made according to the present method can be used as a gas diffusion layer in a fuel cell. (See, e.g., Specification at page 4, Ins. 15-23).

The method comprises the steps of:

- a) immersing a carbon fiber construction in an aqueous dispersion of a metal oxide selected from Type I or Type II, wherein Type I consists of metal oxides having a negative zeta potential and Type II consists of metal oxides having a positive zeta potential (See, e.g., Specification at page 4, Ins. 3-14 and page 5, Ins. 4-19 and Examples);
- b) contacting said dispersion with a counterelectrode (See, e.g., Specification at page 5, Ins. 4-19 and Examples); and
- c) electrophoretically depositing said metal oxide on said carbon fiber construction by applying electric current between said carbon fiber construction and said counterelectrode. (See, e.g., Specification at page 5, Ins. 4-19 and Examples).

When said metal oxide is selected from Type I said carbon fiber construction is the anode, and when said metal oxide is selected from Type II said carbon fiber construction is the cathode. (See, e.g., Specification at page 5, Ins. 4-19).

In some embodiments, the metal oxide is selected from SnO_2 , SiO_2 , and ZrO_2 . In some embodiments, the metal oxide is selected from SiO_2 and ZrO_2 . In some embodiments, the metal oxide is ZrO_2 . (See, e.g., Specification at page 4, Ins. 3-14; page 5, Ins. 4-19 and Examples). In some embodiments, the carbon fiber construction is a woven carbon fiber construction. In some embodiments, the carbon fiber construction is a non-woven carbon fiber construction. (See, e.g., Specification at page 4, Ins. 24-28 and Examples).

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GROUND OF REJECTION TO BE REVIEWED ON APPEAL**First Ground of Rejection**

Claims 1-11 stand rejected under 35 USC § 103(a) as purportedly unpatentable over Boccaccini et al., "Use of Electrophoretic Deposition in the Processing of Fibre Reinforced Ceramic and Glass Matrix Composites: A Review," Composites: Part A 32 (2001) 997-1006 (Elsevier) (referred to herein as "Boccaccini") in view of U.S. Pat. No. 5,840,414 (Bett).

Second Ground of Rejection

Claims 1-11 stand rejected under 35 USC § 103(a) as purportedly unpatentable over U.S. Pat. No. 5,554,271 (Illston) in view of U.S. Pat. No. 5,840,414 (Bett).

ARGUMENT**First Ground of Rejection**

Claims 1-11 stand rejected under 35 USC § 103(a) as purportedly unpatentable over Boccaccini in view of Bett.

It is axiomatic that, in order to establish a prima facie case of obviousness of a claim, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See also In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art.").

Neither of the cited references teach or suggest critical limitations recited in the rejected claims. For that reason, no prima facie case of obviousness has been established and this rejection should be withdrawn.

Claims 1-11

All of the present claims describe treatment of a carbon fiber construction. Neither Boccaccini nor Bett teach or suggest any use of a carbon fiber construction. The carbon fiber construction is the substrate recited in the first step and throughout the method of claim 1, which forms the foundation of the product made by that method, and which renders that product

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suitable for use as a fuel cell gas diffusion layer. Absent this teaching, no prima facie case of obviousness has been established for these claims.

Claim 6

Claim 6 describes treatment of a carbon fiber construction with ZrO_2 . Neither Boccaccini nor Bett teach or suggest the use of ZrO_2 . Absent this teaching, no prima facie case of obviousness has been established for this claim.

Claim 7

Claim 7 describes treatment of a woven carbon fiber construction. Neither Boccaccini nor Bett teach or suggest any use of a woven carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Claim 8

Claim 8 describes treatment of a non-woven carbon fiber construction. Neither Boccaccini nor Bett teach or suggest any use of a non-woven carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Claim 10

Claim 10 recites a method of making a hydrophilic carbon fiber construction capable of wicking 200mg of water per 40mg of the hydrophilic carbon fiber construction. Neither Boccaccini nor Bett teach or suggest a method of making a hydrophilic carbon fiber construction capable of wicking 200mg of water per 40mg of the hydrophilic carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Claim 11

Claim 11 recites a method of making a hydrophilic carbon fiber construction capable of wicking 250mg of water per 40mg of the hydrophilic carbon fiber construction. Neither Boccaccini nor Bett teach or suggest a method of making a hydrophilic carbon fiber construction

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capable of wicking 250mg of water per 40mg of the hydrophilic carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Since no prima facie case of obviousness has been established, these rejections should be reversed.

Second Ground of Rejection

Claims 1-11 stand rejected under 35 USC § 103(a) as purportedly unpatentable over Illston in view of Bett.

It is axiomatic that, in order to establish a prima facie case of obviousness of a claim, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See also In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art.").

Neither of the cited references teach or suggest critical limitations recited in the rejected claims. For that reason, no prima facie case of obviousness has been established and this rejection should be withdrawn.

Claims 1-11

All of the present claims describe treatment of a carbon fiber construction. Neither Illston nor Bett teach or suggest any use of a carbon fiber construction. The carbon fiber construction is the substrate recited in the first step and throughout the method of claim 1, which forms the foundation of the product made by that method, and which renders that product suitable for use as a fuel cell gas diffusion layer. Absent this teaching, no prima facie case of obviousness has been established for these claims.

Claim 6

Claim 6 describes treatment of a carbon fiber construction with ZrO_2 . Neither Illston nor Bett teach or suggest the use of ZrO_2 . Absent this teaching, no prima facie case of obviousness has been established for this claim.

Application No.: 09/997081Case No.: 57255US002Claim 7

Claim 7 describes treatment of a woven carbon fiber construction. Neither Illston nor Bett teach or suggest any use of a woven carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Claim 8

Claim 8 describes treatment of a non-woven carbon fiber construction. Neither Illston nor Bett teach or suggest any use of a non-woven carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Claim 10

Claim 10 recites a method of making a hydrophilic carbon fiber construction capable of wicking 200mg of water per 40mg of the hydrophilic carbon fiber construction. Neither Illston nor Bett teach or suggest a method of making a hydrophilic carbon fiber construction capable of wicking 200mg of water per 40mg of the hydrophilic carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Claim 11

Claim 11 recites a method of making a hydrophilic carbon fiber construction capable of wicking 250mg of water per 40mg of the hydrophilic carbon fiber construction. Neither Illston nor Bett teach or suggest a method of making a hydrophilic carbon fiber construction capable of wicking 250mg of water per 40mg of the hydrophilic carbon fiber construction. Absent this teaching, no prima facie case of obviousness has been established for this claim.

Since no prima facie case of obviousness has been established, these rejections should be reversed.

Application No.: 09/997081Case No.: 57255US002**CONCLUSION**

For the foregoing reasons, appellants respectfully submit that the Examiner has erred in rejecting this application. Please reverse the Examiner on all counts.

Respectfully submitted,

May 10, 2005

Date

By: 

Philip Y. Dahl, Reg. No.: 36,115

Telephone No.: (651) 737-4029

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833

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CLAIMS APPENDIX

1. A method of making a hydrophilic carbon fiber construction comprising the steps of:
 - a) immersing a carbon fiber construction in an aqueous dispersion of a metal oxide selected from Type I or Type II, wherein Type I consists of metal oxides having a negative zeta potential and Type II consists of metal oxides having a positive zeta potential;
 - b) contacting said dispersion with a counterelectrode; and
 - c) electrophoretically depositing said metal oxide on said carbon fiber construction by applying electric current between said carbon fiber construction and said counterelectrode, wherein, when said metal oxide is selected from Type I said carbon fiber construction is the anode and when said metal oxide is selected from Type II said carbon fiber construction is the cathode.
2. The method according to claim 1 wherein said metal oxide is selected from Type I and said carbon fiber construction is the anode.
3. The method according to claim 1 wherein said metal oxide is selected from Type II and said carbon fiber construction is the cathode.
4. The method according to claim 1 wherein said metal oxide is selected from the group consisting of SnO_2 , SiO_2 , and ZrO_2 .
5. The method according to claim 1 wherein said metal oxide is selected from the group consisting of SiO_2 , and ZrO_2 .
6. The method according to claim 1 wherein said metal oxide is ZrO_2 .
7. The method according to claim 1 wherein said carbon fiber construction is a woven carbon fiber construction.

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8. The method according to claim 1 wherein said carbon fiber construction is a non-woven carbon fiber construction.
9. The method according to claim 1 wherein said step of electrophoretically depositing said metal oxide has a duration of not more than 30 minutes.
10. The method according to claim 1 wherein said hydrophilic carbon fiber construction is capable of wicking 200mg of water per 40mg of said hydrophilic carbon fiber construction.
11. The method according to claim 1 wherein said hydrophilic carbon fiber construction is capable of wicking 250mg of water per 40mg of said hydrophilic carbon fiber construction.

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EVIDENCE APPENDIX

None.

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RELATED PROCEEDINGS APPENDIX

None.